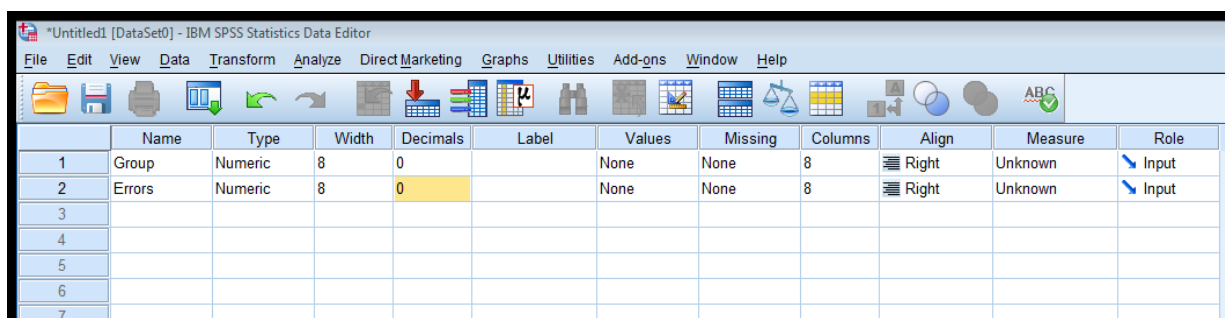


## One-way between ANOVA

In this workshop you will practice a one-way between-subjects ANOVA. This is used when you have one between IV with more than 2 conditions/levels to compare.

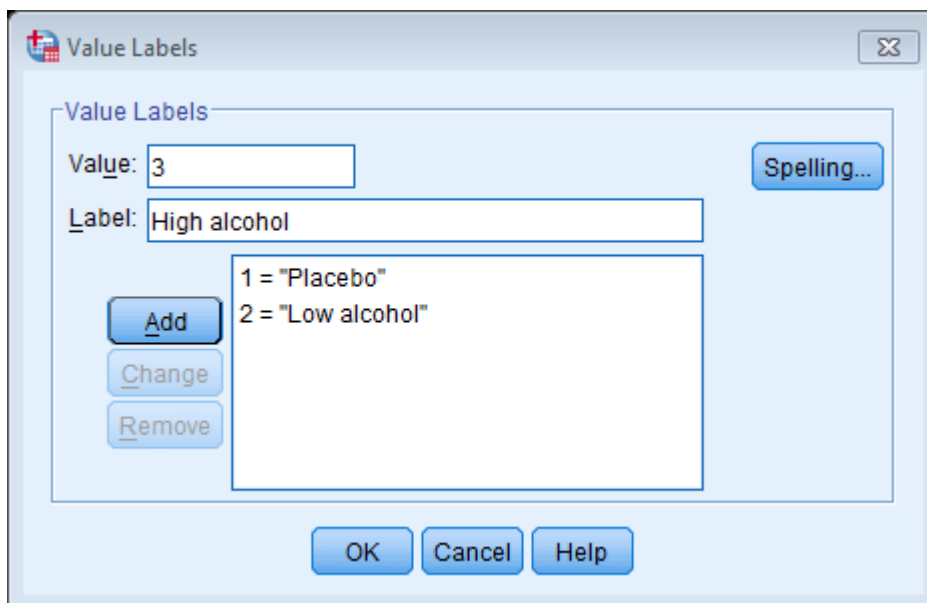
We will be using sample data from a study aiming to discover the effects of alcohol (IV) on driving ability (DV). Twenty-seven participants were randomly allocated to one of three different conditions: placebo (no alcohol), low alcohol, and high alcohol. The non-alcoholic drink looked and tasted the same as the alcoholic drink. Participants were weighed and given the appropriate amount of drink. After half an hour of drinking participants drove a simulator for 10 minutes and the number of errors made whilst driving was recorded.

First, click on the 'Variable View' tab at the bottom and define each of the columns as shown below by simply typing in the column names as shown in the 'Name' column of the variable view.



|   | Name   | Type    | Width | Decimals | Label | Values | Missing | Columns | Align | Measure | Role  |
|---|--------|---------|-------|----------|-------|--------|---------|---------|-------|---------|-------|
| 1 | Group  | Numeric | 8     | 0        |       | None   | None    | 8       | Right | Unknown | Input |
| 2 | Errors | Numeric | 8     | 0        |       | None   | None    | 8       | Right | Unknown | Input |
| 3 |        |         |       |          |       |        |         |         |       |         |       |
| 4 |        |         |       |          |       |        |         |         |       |         |       |
| 5 |        |         |       |          |       |        |         |         |       |         |       |
| 6 |        |         |       |          |       |        |         |         |       |         |       |
| 7 |        |         |       |          |       |        |         |         |       |         |       |

Next, label the values for your IV. Click on the 'Values' column in the 'Group' row and click on the small blue box that appears. You will then see the dialogue box where you can define your variable. Type the number in the value box, type the name of the group in the label box and then click 'add'. Here we have the IV coded with the three groups '1=Placebo, 2=low alcohol, 3=high alcohol'.



Value Labels

Value: 3

Label: High alcohol

Add

Change

Remove

1 = "Placebo"

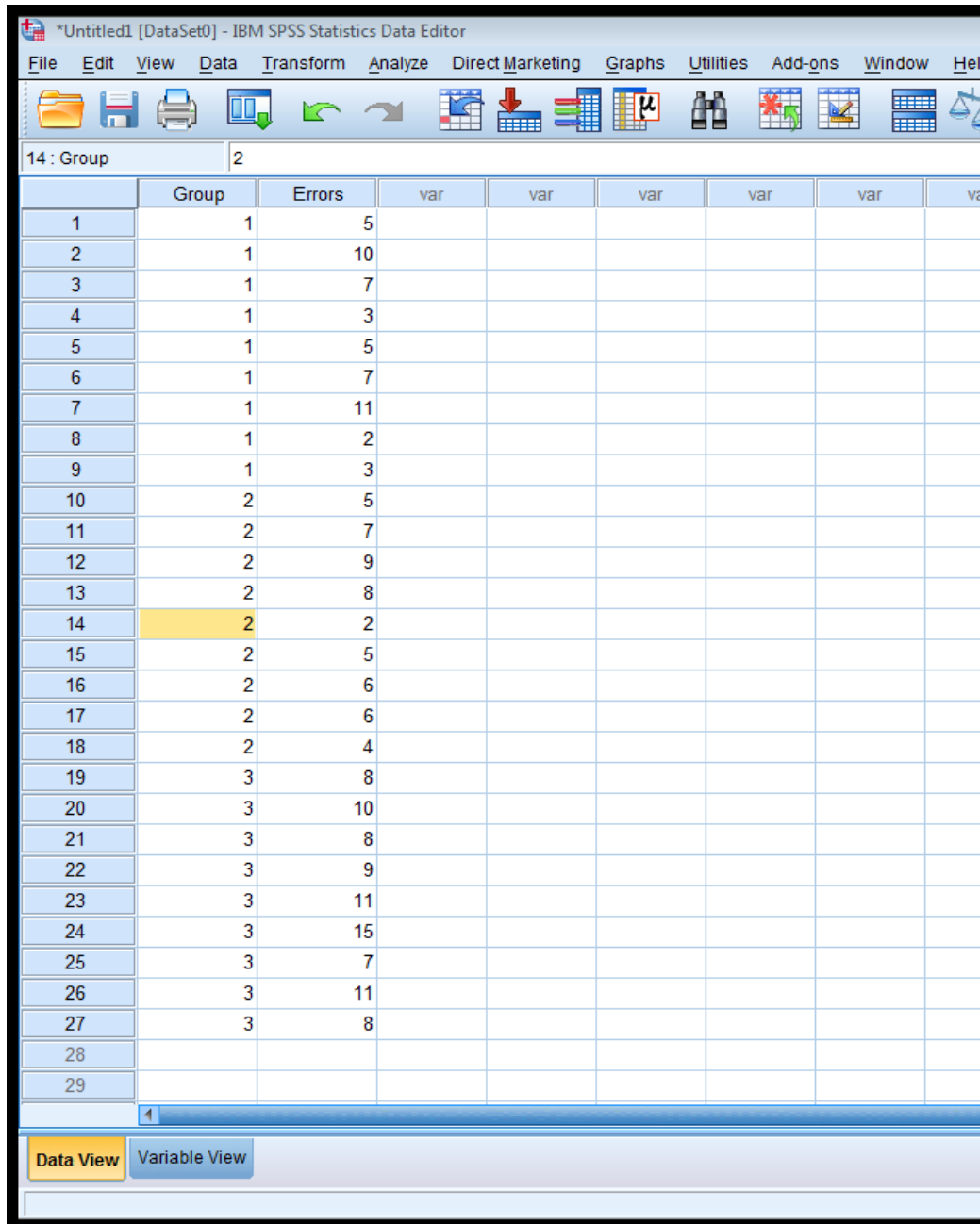
2 = "Low alcohol"

Spelling...

OK Cancel Help

Click back to the 'Data View' tab and enter the data as shown below, which represents data from the three groups (placebo, low alcohol, and high alcohol). You will need to type out the number that you coded each of the three groups for the number of participants in that group and then place their driving error score in the column next to it.

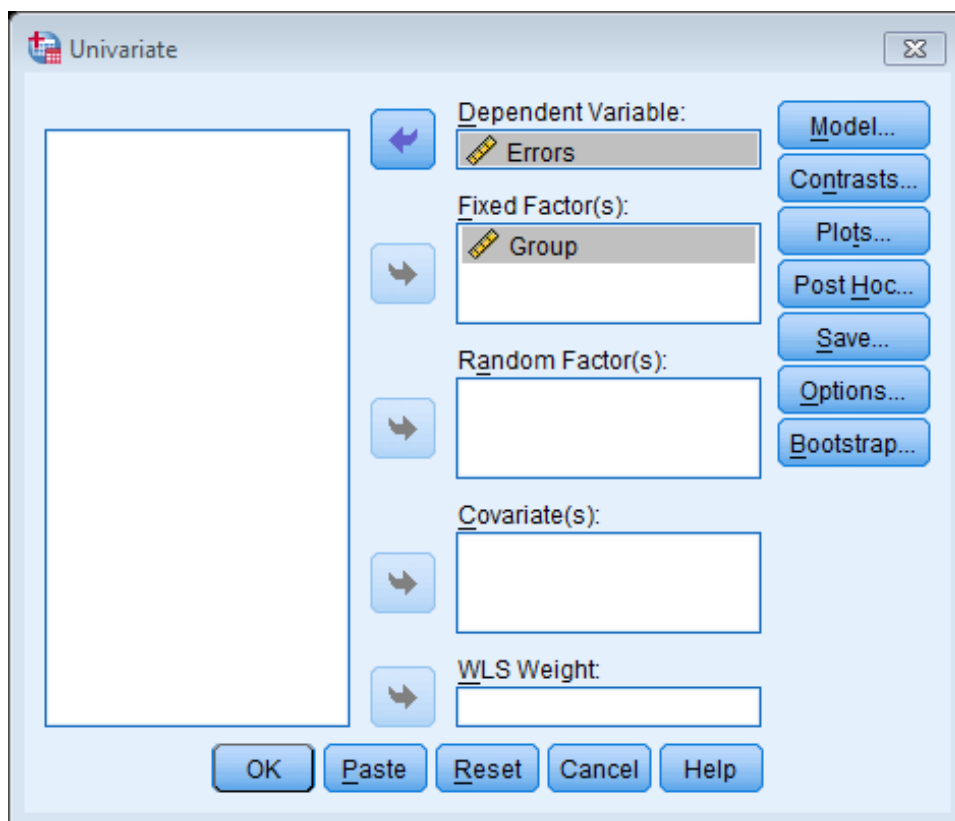
*Remember: One row of data = one participant's data (including grouping for the between variables in this case).*



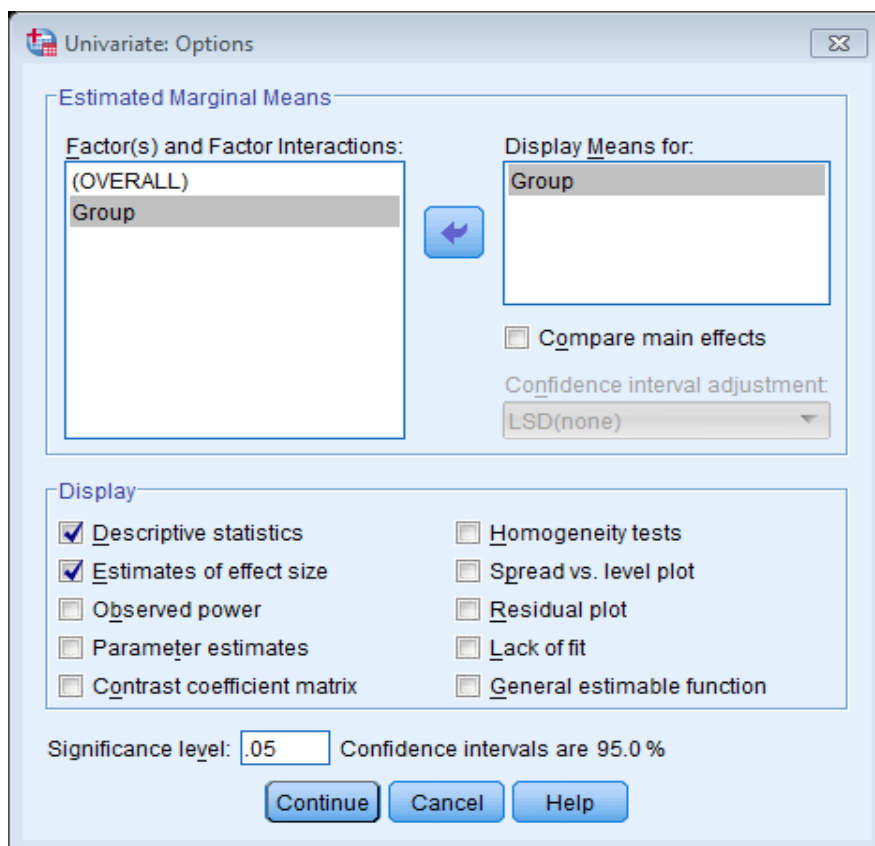
|    | Group | Errors | var | var | var | var | var | var |
|----|-------|--------|-----|-----|-----|-----|-----|-----|
| 1  | 1     | 5      |     |     |     |     |     |     |
| 2  | 1     | 10     |     |     |     |     |     |     |
| 3  | 1     | 7      |     |     |     |     |     |     |
| 4  | 1     | 3      |     |     |     |     |     |     |
| 5  | 1     | 5      |     |     |     |     |     |     |
| 6  | 1     | 7      |     |     |     |     |     |     |
| 7  | 1     | 11     |     |     |     |     |     |     |
| 8  | 1     | 2      |     |     |     |     |     |     |
| 9  | 1     | 3      |     |     |     |     |     |     |
| 10 | 2     | 5      |     |     |     |     |     |     |
| 11 | 2     | 7      |     |     |     |     |     |     |
| 12 | 2     | 9      |     |     |     |     |     |     |
| 13 | 2     | 8      |     |     |     |     |     |     |
| 14 | 2     | 2      |     |     |     |     |     |     |
| 15 | 2     | 5      |     |     |     |     |     |     |
| 16 | 2     | 6      |     |     |     |     |     |     |
| 17 | 2     | 6      |     |     |     |     |     |     |
| 18 | 2     | 4      |     |     |     |     |     |     |
| 19 | 3     | 8      |     |     |     |     |     |     |
| 20 | 3     | 10     |     |     |     |     |     |     |
| 21 | 3     | 8      |     |     |     |     |     |     |
| 22 | 3     | 9      |     |     |     |     |     |     |
| 23 | 3     | 11     |     |     |     |     |     |     |
| 24 | 3     | 15     |     |     |     |     |     |     |
| 25 | 3     | 7      |     |     |     |     |     |     |
| 26 | 3     | 11     |     |     |     |     |     |     |
| 27 | 3     | 8      |     |     |     |     |     |     |
| 28 |       |        |     |     |     |     |     |     |
| 29 |       |        |     |     |     |     |     |     |

Now you can start to run the ANOVA analysis. On the 'Analyze' menu, select the option for 'General linear model' and then the option for 'Univariate'.

You will see the following dialogue box (below). Transfer the DV (errors) into the 'Dependent Variable' box, and transfer the IV (group) into the 'Fixed Factors' box.



Click on the 'Options' button. Move the Group to the 'Display means for' box. Select the tick boxes for 'Descriptive statistics' and 'Estimates of effect size' and click 'Continue'.



SPSS will produce the following output tables (it also produces others):

### **Descriptive Statistics**

In this table the descriptives are shown for different conditions of your study. This is useful for referring back to in order to understand where differences have been shown to be significant or non-significant. (N= number of scores in the grouping where shown).

### **Tests of Between-Subjects Effects**

You need to check the Main Effect of the IV. Find the column you are interested in (e.g., Group). To determine whether there is a main effect for the IV, check in the column marked Sig. next to the variable.

The format for reporting the output analysis for the main effects is:

In its general format:  **$F(df, df) = F\text{-value}, p </> .05$**  (Remember you need 2 degrees of freedom values: the df from the IV and the error df).

Conduct any appropriate post-hoc tests if necessary.

In the space below, write out the necessary output data (using the output table you have now produced) in the correct format (as described above). This should include an analysis of the main effects of the IV and any results from post-hoc tests.

Hint: remember to check back to the descriptives to help you understand what each of these analyses has shown you about the effects.